

Monthly Marine Biotoxin Report

April 2005

Technical Report No. 05-13

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of April 2005. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

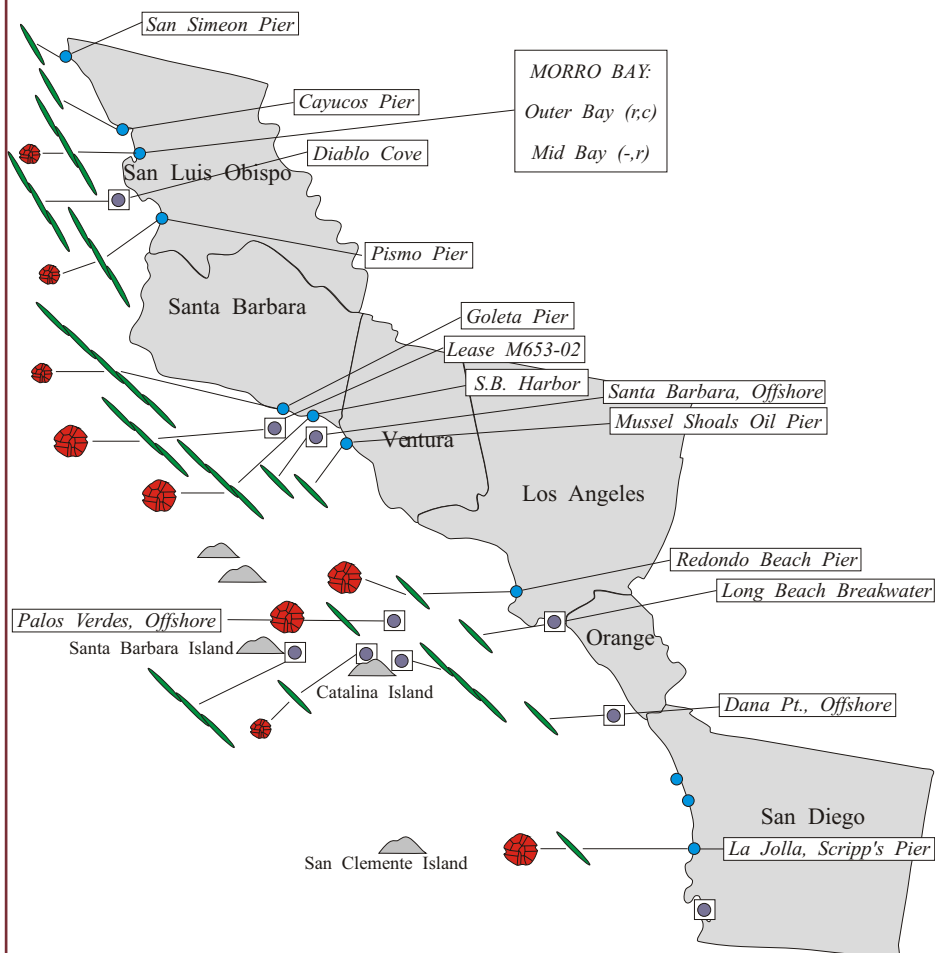
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed along most of the Southern California coast during April (Figure 1). The distribution and relative abundance of

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during April, 2005.



Relative Abundance of Known Toxin Producers

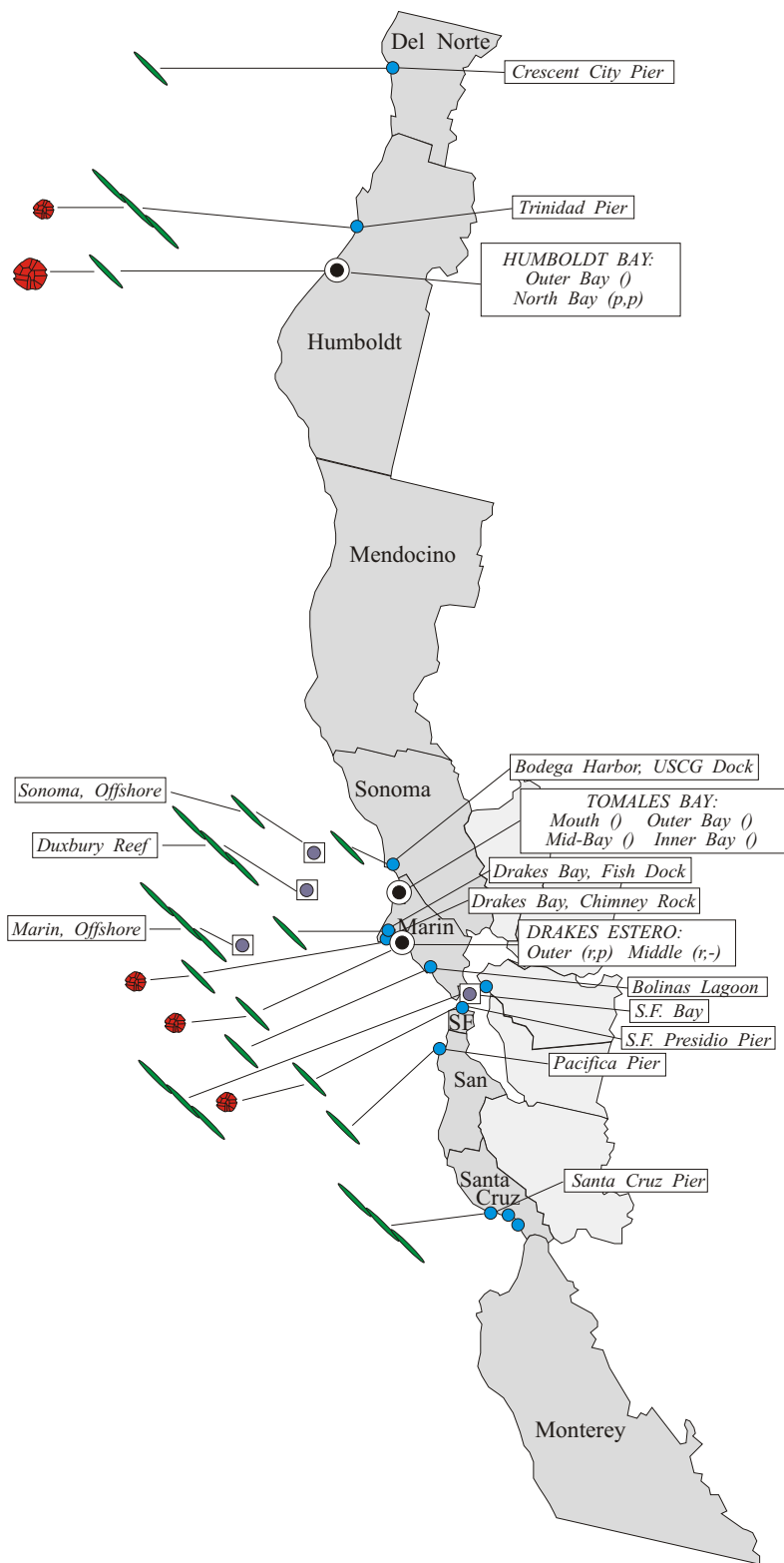
| Alexandrium Species | | Pseudo-nitzschia Species | |
|---------------------|------------------------------|--------------------------|------------------------------|
| | Rare (less than 1%) | | Present (less than 10%) |
| | Present (between 1% and 10%) | | Common (between 10% and 50%) |
| | Common (between 10% and 50%) | | Abundant (greater than 50%) |
| | Abundant (greater than 50%) | | |

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during April, 2005.



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this toxin-producing dinoflagellate increased significantly compared to observations in March. The highest cell numbers were observed at Pismo Pier and farther south at the Santa Barbara sites. Cell densities were low at most other sites. Of particular interest was the observation of *Alexandrium* at two sites offshore of Los Angeles, including a site near Catalina Island.

The PSP toxicity detected offshore of Santa Barbara in late March increased significantly by the first week of April (Figure 3). PSP toxin levels continued to increase at this site through April 21 when the concentration reached 448 ug and 153 ug in mussels and oysters, respectively. Earlier in the month a sample of rock scallop viscera was found to contain 185 ug of PSP toxins. Mussels from nearshore sites in Santa Barbara, Ventura, and Los Angeles also were found to contain low levels of these toxins.

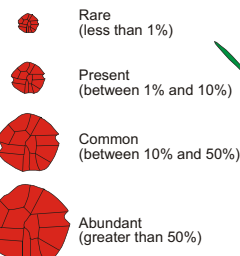
Domoic Acid

Pseudo-nitzschia was observed at sites along the entire Southern California coast in April (Figure 1). The relative abundance of this diatom increased at sites from San Luis Obispo to offshore of Los Angeles County. The highest relative abundance was observed at Goleta Pier (Santa Barbara County), however the highest cell mass was

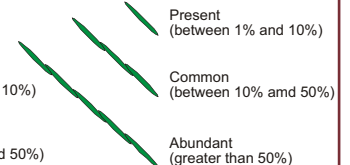
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



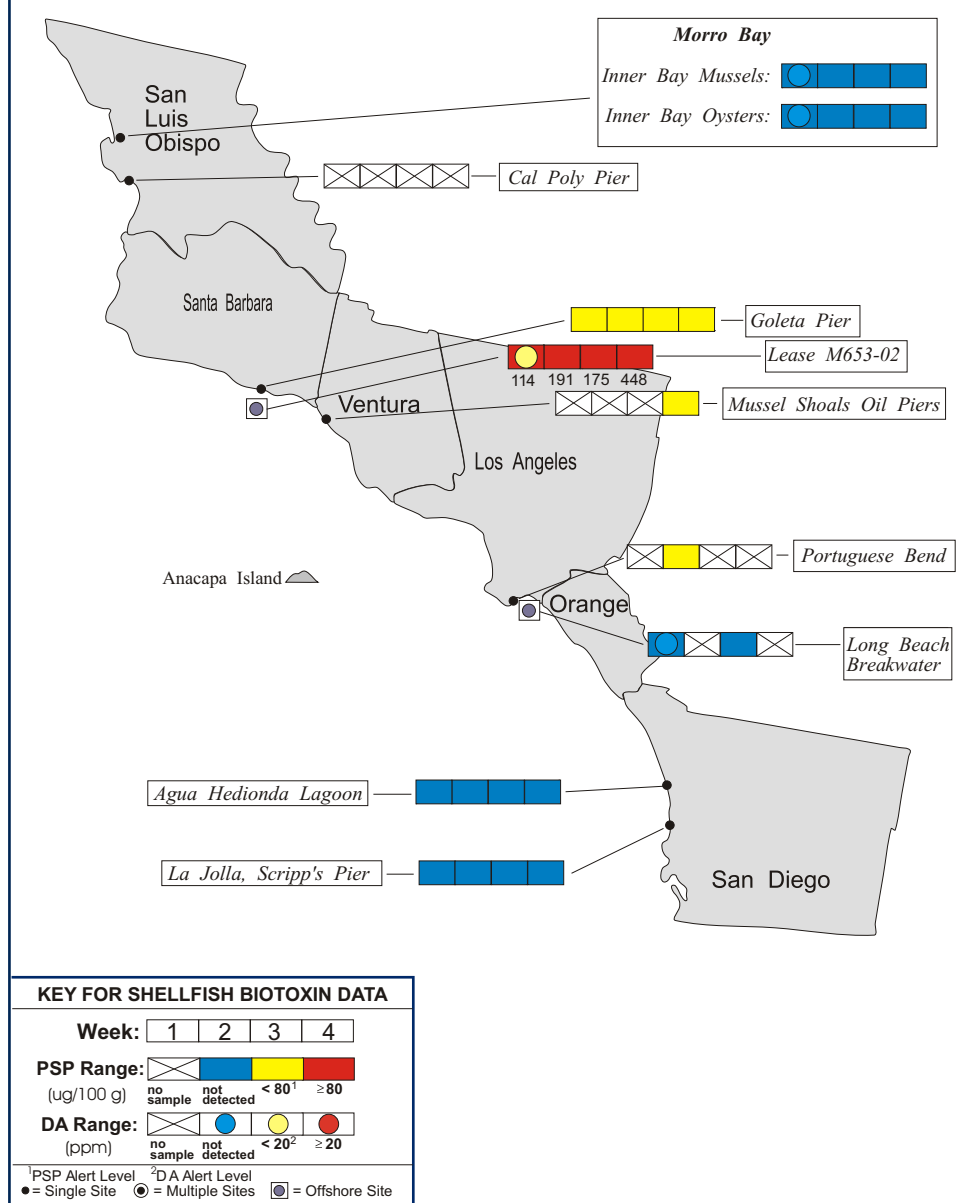
MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during April, 2005.



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detected in samples from Morro Bay and Pismo Pier (San Luis Obispo County). A very low level of domoic acid (1.5 ppm) was detected in oysters offshore of Santa Barbara.

Non-toxic Species

Phytoplankton diversity and cell density increased significantly compared to past months. Diatoms dominated the assemblage along the San Luis Obispo and Santa Barbara coast and offshore near Catalina Island. The most abundant species were *Chaetoceros* and *Thalassiosira*. Dinoflagellates (*Ceratium spp.*, *Lingulodinium polyedrum*, *Prorocentrum micans*) were common at sites in Ventura through San Diego, although some diatom species were also common at sites along the Los Angeles coast.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium distribution was similar to observations in March, however the relative abundance increased slightly in Humboldt Bay (Figure 2). Low numbers of this dinoflagellate were also observed at sites along the coast of Humboldt, Marin, and San Francisco counties.

A low concentration of PSP toxins was

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

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For Recorded Biotoxin Information Call:
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detected at the sentinel mussel station in Drakes Bay (Marin County) (Figure 4). All other samples did not contain detectable levels of these toxins.

Domoic Acid

Pseudo-nitzschia was observed along most of the Northern California coast in April (Figure 2). The relative abundance of this diatom increased slightly at nearshore sites in Humboldt and Santa Cruz counties, as well as in samples offshore of Sonoma and Marin counties and inside San Francisco Bay.

Non-toxic Species

Phytoplankton diversity and abundance increased significantly in April. Diatoms were the dominant group and included *Skeletonema*, *Chaetoceros*, *Thalassiosira*, and *Bacteriastrium*. The dinoflagellates *Prorocentrum* and *Ceratium* were also common, particularly at sites inside Monterey Bay along the Santa Cruz coast.



QUARANTINES:

The health advisory issued on June 10 remained in effect. This advisory warned consumers to avoid eating sport-harvested shellfish from Humboldt and Del Norte counties and was the result of dangerous levels of domoic acid in razor clams collected from this region. Some shellfish species such as mussels may eliminate the toxin relatively quickly once the toxin-producing diatoms are gone. Razor clams, however, retain the toxin in the edible tissue for considerable periods of time and

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Figure 4. Distribution of shellfish biotoxins in Northern California during April, 2005.

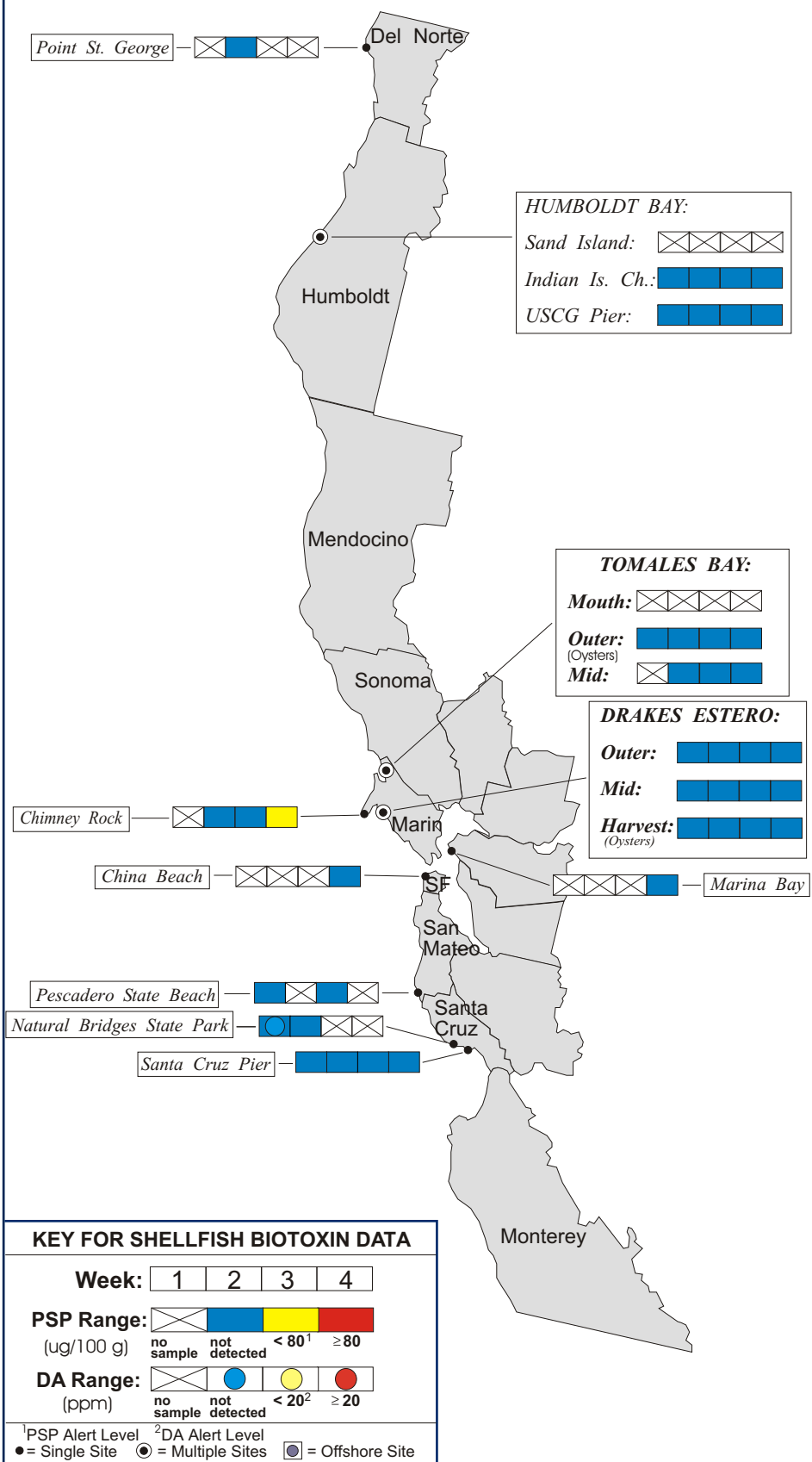


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during April, 2005.

| COUNTY | AGENCY | # SAMPLES |
|------------------------|---|-----------|
| Del Norte | Del Norte County Health Department | 1 |
| Humboldt | Coast Seafood Company | 8 |
| Mendocino | None Submitted | |
| Sonoma | None Submitted | |
| Marin | Cove Mussel Company | 3 |
| | Hog Island Oyster Company | 5 |
| | Johnson Oyster Company | 16 |
| | Marin Oyster Company | 2 |
| | DHS Marine Biotoxin Monitoring Program | 3 |
| San Francisco | San Francisco County Health Department | 1 |
| San Mateo | San Mateo County Environmental Health Department | 2 |
| Santa Cruz | U.C. Santa Cruz | 4 |
| | Santa Cruz County Environmental Health Department | 2 |
| Monterey | None Submitted | |
| San Luis Obispo | Williams Shellfish Company | 10 |
| Santa Barbara | Santa Barbara Mariculture Company | 18 |
| | U.C. Santa Barbara Marine Science Institute | 4 |
| Ventura | Ventura County Environmental Health Department | 1 |
| Los Angeles | Aquarium of the Pacific Long Beach | 4 |
| | Los Angeles County Health Department | 1 |
| Orange | None Submitted | |
| San Diego | Carlsbad Aquafarms, Inc. | 5 |
| | Scripps Institution of Oceanography | 4 |

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represent a unique public health threat.

The annual quarantine on the sport-harvesting of mussels is scheduled to go into effect on May 1 and will continue through October 31. The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All commercial shellfish growers certified by the State of California are required to submit routine samples for biotoxin analysis, allowing stringent monitoring for the occurrence of any toxin. Harvesting closures are imposed if toxin levels reach the federal alert level.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport-harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during April, 2005.

| COUNTY | AGENCY | # SAMPLES |
|-----------------|--|-----------|
| Del Norte | Del Norte County Health Department | 4 |
| Humboldt | Coast Seafood Company | 4 |
| | DHS Volunteer (Jacki Riley) | 3 |
| Mendocino | None Submitted | |
| Sonoma | Cordell Banks National Marine Sanctuary | 1 |
| | DHS Volunteer (Cathleen Cannon) | 1 |
| Marin | CDHS Volunteers (Brert Anderson, Mary Von Tölsdorf, Marjorie Siegel) | 8 |
| | Gulf of the Farallones National Marine Sanctuary | 2 |
| | DHS Marine Biotoxin Monitoring Program | 4 |
| | Johnson Oyster Company | 8 |
| Contra Costa | DHS Marine Biotoxin Monitoring Program | 1 |
| San Francisco | CDHS Volunteer (Eugenia McNaughton) | 2 |
| | Gulf of the Farallones National Marine Sanctuary | 1 |
| San Mateo | San Mateo County Environmental Health Department | 2 |
| Santa Cruz | U.C. Santa Cruz | 4 |
| | Santa Cruz County Environmental Health Department | 6 |
| Monterey | None Submitted | |
| San Luis Obispo | CDHS Volunteers (Renee and Auburn Atkins) | 3 |
| | Morro Bay National Estuary Program | 6 |
| | DHS Marine Biotoxin Monitoring Program | 3 |
| | Morro Bay Natural History Museum | 3 |
| | Tenera Environmental Inc. | 2 |
| Santa Barbara | U.C. Santa Barbara Marine Science Institute | 6 |
| | Santa Barbara Mariculture Company | 9 |
| | Catalina Tall Ships Expeditions | 2 |
| | Santa Barbara Channel Keeper | 1 |
| | Santa Barbara City College | 1 |
| Ventura | Ventura County Environmental Health Department | 1 |
| Los Angeles | University of Southern California | 2 |
| | Los Angeles County Sanitation District | 4 |
| | Catalina Tall Ships Expeditions | 9 |
| | Aquarium of the Pacific Long Beach | 3 |
| | Catalina Island Marine Institute | 4 |
| | CDHS Volunteer (Richard Weaver) | 1 |
| Orange | Ocean Institute | 1 |
| San Diego | Scripps Institution of Oceanography | 4 |

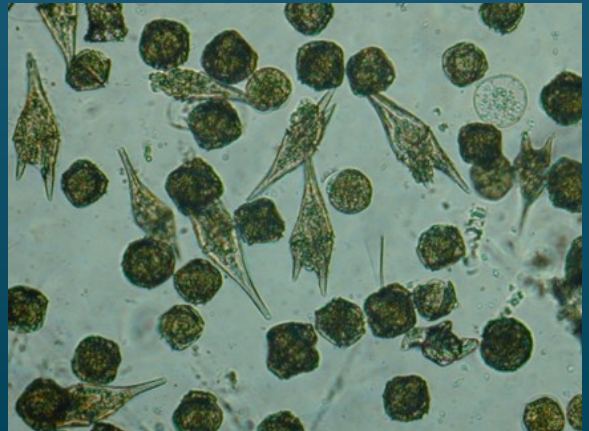
PHYTOPLANKTON GALLERY



A variety of diatom species were abundant along the California coast during April.



The diatoms Chaetoceros and Skeletonema were abundant at various sites along the Northern California coast.



Although diatoms were dominant throughout April, the dinoflagellates Ceratium and Lingulodinium polyedrum were common at sites in Ventura through San Diego.